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EXAMINER	
THOMPSON, JAMES A	
ART UNIT	**PAPER NUMBER**
2624	5

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	09/688,610	DONOVAN ET AL.
	Examiner	Art Unit
	James A Thompson	2624

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address* --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on 13 October 2000.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-33 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-33 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-15, 18, 22-23, 25-27 and 29-30 are rejected under 35 U.S.C. 102(b) as being anticipated by Ohno (US Patent 5,813,333).

Claims 12 and 14 disclose the same limitations and are therefore discussed together.

Regarding claim 1: Ohno discloses an apparatus (figure 1 of Ohno) for printing a desired image on a printing medium, based upon input image data, by construction from individual marks formed in a pixel grid (column 6, lines 29-31 of Ohno).

Said apparatus comprises at least one multielement incremental-printing array (figure 2(11) and column 4, lines 29-30 of Ohno) that is subject to colorant-deposition error (column 7, lines 12-17 of Ohno).

Said apparatus further comprises means for measuring (figure 1(400,500) of Ohno) such colorant-deposition error of at least one array (column 6, lines 41-44 and lines 53-56 of Ohno).

Said apparatus further comprises means for modifying (figure 1(700,800) of Ohno) a multicolumn, multirow numerical tabulation (figure 4(21) of Ohno) that forms a

mapping between such input image data and such marks (column 7, lines 12-19 of Ohno), to compensate for the measured colorant-deposition error (column 6, lines 60-63 of Ohno).

Said apparatus further comprises means for printing (figure 2 of Ohno) using the modified mapping (column 6, lines 64-67 of Ohno).

Regarding claim 2: Ohno discloses that said mapping is selected from the group consisting of an optical-density transformation of the image data (column 6, lines 34-37 of Ohno) to such construction from individual marks (column 6, lines 37-40 of Ohno); and a spatial-resolution relationship between the image data and such pixel grid (figure 4 and column 7, lines 12-19 of Ohno).

Regarding claim 3: Ohno discloses that said optical-density transformation comprises a halftoning matrix (column 6, lines 37-40 of Ohno). Since picture element data is obtained (column 6, lines 37-40 of Ohno) for the purpose of printing (column 6, lines 64-67 of Ohno), a halftoning matrix is inherent in said optical-density transformation.

Ohno further discloses that said spatial-resolution relationship comprises a scaling of the image data to such pixel grid (figure 4 and column 7, lines 12-17 of Ohno). As can clearly be seen in figure 4 of Ohno, image data areas are arranged such that the pixel grid marks can be placed at specific predetermined positions for each color (column 7, lines 12-17 of Ohno).

Regarding claim 4: Ohno discloses that said at least one multielement incremental-printing array (figure 2(11) of Ohno) comprises a plurality of multielement

printing arrays (figure 2(12-13) of Ohno) that print in a corresponding plurality of different colors or color dilutions (column 7, lines 7-12 of Ohno), each multielement printing array being subject to a respective colorant-deposition error (column 7, lines 12-17 of Ohno). Said multielement incremental-printing array comprises two set of CMYK printing arrays, one on the left and one on the right, as shown in figure 2 of Ohno. Each color of each array has a corresponding plate cylinder (figure 2(12) of Ohno) and blanket cylinder (figure 2(13) of Ohno) (column 7, lines 7-12 of Ohno).

Ohno further discloses that said measuring means (figure 1(400,500) of Ohno) and said mapping-modifying means (figure 1(700,800) of Ohno) each operate with respect to each one of the plurality of multielement printing arrays respectively (column 6, lines 64-67 of Ohno).

Regarding claim 5: Ohno discloses that, for at least one of the plurality of multielement printing arrays, the colorant-deposition error comprises a respective pattern of printing-density defects (column 8, lines 6-11 of Ohno) for each multielement printing array respectively (column 6, lines 64-67 of Ohno). An error in the printing registration (column 8, lines 6-11 of Ohno) will inherently cause a pattern of printing-density defects since misregistration is an offset from the location a color is supposed to print. Said offset affects the printing of the entire image.

Ohno further discloses that said measuring means (figure 1(400,500) of Ohno) comprises means for measuring (figure 1(500) of Ohno) the pattern of printing-density defects (column 6, lines 53-56 of Ohno) for each multielement printing array respectively (column 6, lines 64-67 of Ohno).

Ohno further discloses that said modifying means (figure 1(700,800) of Ohno) comprises means for applying (figure 1(800) of Ohno) the respective pattern of defects, for at least one of the multielement printing arrays, to modify a respective said mapping (column 6, lines 60-63 of Ohno).

Regarding claim 6: Ohno discloses that, for at least on of the plurality of multielement printing arrays (column 6, lines 64-67 of Ohno), the colorant-deposition error comprises a swath-height error (column 8, lines 6-11 of Ohno). A registration error (column 8, lines 8-11 of Ohno) will inherently create a swath-height error since a registration error creates an offset in the overall printing of a particular color.

Ohno further discloses that said measuring means (figure 1(400,500) of Ohno) comprises means for measuring (figure 1(500) of Ohno) the swath-height error (column 6, lines 53-56 of Ohno) for each multielement printing array respectively (column 6, lines 64-67 of Ohno).

Ohno further discloses that said modifying means (figure 1(700,800) of Ohno) comprises means for applying (figure 1(800) of Ohno) the respective swath-height error, for at least one of the multielement printing arrays, to modify a respective said mapping (column 6, lines 60-63 of Ohno).

The pattern of printing-density defects is caused by swath-height error, since said swath-height error is essentially a misregistration of at least one color in the color printing system (column 6, lines 56-63 of Ohno). Therefore, the means for measuring the swath height error is the same as the means for measuring the pattern of printing-

density defects, and the means for applying the respective swath height error is the same as the means for applying the respective pattern of defects.

Regarding claim 7: Ohno discloses that the colorant-deposition error comprises a pattern of printing-density defects (column 8, lines 6-11 of Ohno). An error in the printing registration (column 8, lines 6-11 of Ohno) will inherently cause a pattern of printing-density defects since misregistration is an offset from the location a color is supposed to print. Said offset affects the printing of the entire image.

Ohno further discloses that said measuring means (figure 1(400,500) of Ohno) comprises means for measuring (figure 1(500) of Ohno) the pattern of printing-density defects (column 6, lines 53-56 of Ohno).

Ohno further discloses that said modifying means (figure 1(700,800) of Ohno) comprises means for deriving (figure 1(700) of Ohno) a correction pattern from the measured pattern of printing-density defects (column 6, lines 60-62 of Ohno); and means for applying (figure 1(800) of Ohno) the correction pattern to modify a halftone threholding process (column 6, lines 62-63 of Ohno).

Ohno further discloses that said printing means (figure 2 of Ohno) comprises means for printing (figure 2(11-18) of Ohno) such image using said modified halftone thresholding process (column 6, lines 64-67 of Ohno).

Regarding claim 8: Ohno discloses that the colorant-deposition error comprises a swath-height error or otherwise corresponds to an optimum distance of printing-medium advance (column 8, lines 6-11 of Ohno). A registration error (column 8, lines 8-

11 of Ohno) will inherently create a swath-height error since a registration error creates an offset in the overall printing of a particular color.

Ohno further discloses that said measuring means (figure 1(400,500) of Ohno) comprises means for measuring (figure 1(500) of Ohno) the swath-height error or determining the optimum distance (column 6, lines 53-56 of Ohno).

Ohno further discloses that said modifying means (figure 1(700,800) of Ohno) comprises means for deriving (figure 1(700) of Ohno) a correction pattern from the measured swath-height error or determined optimum distance (column 6, lines 60-62 of Ohno); and means for applying (figure 1(800) of Ohno) the correction pattern to modify a halftone threholding process (column 6, lines 62-63 of Ohno).

Ohno further discloses that said printing means (figure 2 of Ohno) comprises means for printing (figure 2(11-18) of Ohno) such image using said modified halftone thresholding process (column 6, lines 64-67 of Ohno).

Regarding claim 9: The method of claim 9 is performed by the apparatus of claim 7, which further limits the apparatus of claim 1. The arguments regarding claim 1 and claim 7 are incorporated herein.

Regarding claim 10: Ohno discloses using a printmask to determine a relationship between the halftone matrix and the multielement array (figure 2(11-13) and column 7, lines 3-9 of Ohno). It is well known that a B-B type print unit (figure 2(11) and column 7, lines 4-6 of Ohno) is a print unit that contains two printing elements for each color, as further evidenced by two plate cylinders (figure 2(12) of Ohno) and two blanket cylinders (figure 2(13) of Ohno) for each color (figure 2 and column 7, lines 7-9 of

Ohno). Printing using a B-B type unit would therefore inherently require some form of printmask to determine a relationship between the halftone matrix and the multielement array, since each printing unit prints only certain lines of the image.

Ohno further discloses employing the relationship in the applying step to control application of the correction pattern to the halftone matrix (column 6, lines 64-67 of Ohno).

Regarding claim 11: Ohno discloses that the printing step comprises single-pass printing (column 7, lines 20-22 of Ohno). Printing is performed as the paper travels along spinning rollers (figure 3(17) and column 7, lines 20-22 of Ohno) at a specific rate of rotation (column 7, lines 32-39 of Ohno). Therefore, the printing must inherently be single-pass printing since the rotation of said rollers prevents a second printing pass.

Regarding claims 12 and 14: Ohno discloses that the measuring (column 6, lines 53-56 of Ohno), deriving (column 6, lines 60-62 of Ohno), applying (column 6, lines 62-63 of Ohno) and printing steps (column 6, lines 64-67 of Ohno) are employed to modify swath height of at least one of the scanning multielement printing arrays, for accommodating any swath-height error present in each multielement printing array respectively (column 6, lines 53-56 and lines 60-67 of Ohno). A registration error (column 8, lines 8-11 of Ohno) will inherently create a swath-height error since a registration error creates an offset in the overall printing of a particular color.

Regarding claim 13: Ohno discloses that the measuring, deriving, applying and printing steps are each performed with respect to each multielement printing array respectively (column 6, lines 64-67 of Ohno).

Regarding claim 15: It is inherent that the halftone threshold process comprises definition of a halftone matrix. Without a defined halftone matrix, it is not possible to perform a halftone threshold process.

Regarding claim 18: Ohno discloses said applying step (column 6, lines 60-63 of Ohno). Said applying step applies a correction to the printing registration (column 6, lines 60-63 of Ohno). It would therefore be inherent that said applying step comprises replacing values above or below a threshold value since correcting the printing registration would alter the positions at which halftone data is printed (column 6, lines 62-67 of Ohno).

Regarding claim 22: Ohno discloses that image processing (column 7, lines 12-17 of Ohno) and printing is performed as the paper travels along spinning rollers (figure 3(17) of Ohno) and is then cut and folded (column 7, lines 20-22 of Ohno). Therefore, for each of the plurality of multielement arrays (figure 2(11) of Ohno), said measuring, deriving and applying steps are each performed at most only one time for a full image.

Regarding claim 23: Ohno discloses that the applying step comprises modifying the darkness of substantially each mark printed by an individual printing element whose density is defective (column 16, lines 33-36 of Ohno). By correcting for small deviations (dx,dy) in the registration (column 16, lines 33-36 of Ohno), the darkness of substantially each mark will be modified. The printing density will inherently

be altered when the printed lines from a color are shifted in one direction by dx and in the other direction by dy. Furthermore, the deviation of the registration by dx and/or dy inherently causes an error in print density.

Regarding claim 25: Ohno discloses measuring a parameter (dx,dy) related to print quality defects (column 16, lines 33-36 of Ohno) due to departure of printing-medium advance from an optimum value (column 15, lines 33-38 of Ohno).

Ohno further discloses scaling input image data to compensate for said departure (column 16, lines 35-36 of Ohno). The registration errors dx and dy are compensated for (column 16, lines 35-36 of Ohno), thus scaling the input image data.

Ohno further discloses printing a desired image using the scaled input image data (column 6, lines 64-67 of Ohno).

Regarding claim 26: Ohno discloses that the parameter (dx,dy) comprises such print-quality defects (column 15, lines 33-38 of Ohno); and the measuring step comprises measuring such print quality defects (column 16, lines 33-34 of Ohno).

Regarding claim 27: Ohno discloses that the defects comprise swath-height error (column 15, lines 33-38 of Ohno); and the measuring step comprises measuring swath-height error (column 16, lines 33-34 of Ohno). A registration error (column 8, lines 8-11 of Ohno) will inherently create a swath-height error since a registration error creates an offset in the overall printing of a particular color.

Regarding claim 29: Ohno discloses that the parameter (dx,dy) comprises such optimum value (column 16, lines 33-36 of Ohno); and the measuring step comprises

determining such optimum value (column 16, lines 33-34 of Ohno). In correcting the registration errors (column 16, lines 33-36 of Ohno), the printing is properly aligned.

Regarding claim 30: Ohno discloses that the measuring, scaling and printing steps are each performed with respect to each multielement printing array respectively (column 6, lines 64-67 of Ohno).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 16-17, 19-21 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ohno (US Patent 5,813,333) in view of Takayanagi (US Patent 5,289,210).

Regarding claim 16: Ohno discloses printing for four colors by a color printer (column 6, lines 65-67 of Ohno), which inherently requires some form of halftone thresholding in order to make the individual color dots.

Ohno does not disclose expressly that said halftone threholding process comprises an error-diffusion protocol.

Takayanagi discloses a halftone threholding process comprising an error-diffusion protocol (column 7, lines 58-61 of Takayanagi).

Ohno and Takayanagi are combinable because they are from the same field of endeavor, namely image printing and correction. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to apply error diffusion to the halftone processing. The motivation for doing so would have been to convert the grayscale data to binary data that is suitable for printing (column 7, lines 58-61 of Takayanagi). Therefore, it would have been obvious to combine Takayanagi with Ohno to obtain the invention as specified in claim 16.

Further regarding claim 17: Error-diffusion inherently comprises a progressive error-distribution allocation protocol of such error-diffusion halftoning; and a decisional protocol for determining whether to mark a particular pixel. This is by definition the operation of an error diffusion algorithm.

Regarding claim 19: Ohno discloses said applying step (column 6, lines 60-63 of Ohno).

Ohno does not disclose expressly that said applying step comprises multiplying values by a linear factor.

Takayanagi discloses multiplying values by a linear factor (figure 11 and column 7, lines 32-39 of Takayanagi).

Ohno and Takayanagi are combinable because they are from the same field of endeavor, namely image printing and correction. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to apply correction to the image data by using a linear gamma correction, as taught by Takayanagi. The motivation for doing so would have been to correct density unevenness (column 8, lines

49-51 of Takayanagi). Therefore, it would have been obvious to combine Takayanagi with Ohno to obtain the invention as specified in claim 19.

Regarding claim 20: Ohno discloses said applying step (column 6, lines 60-63 of Ohno).

Ohno does not disclose expressly that said applying step comprises applying a gamma correction function to values.

Takayanagi discloses applying gamma correction to values (figure 11 and column 7, lines 32-39 of Takayanagi).

Ohno and Takayanagi are combinable because they are from the same field of endeavor, namely image printing and correction. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to apply correction to the image data by using a gamma correction function, as taught by Takayanagi. The motivation for doing so would have been to correct density unevenness (column 8, lines 49-51 of Takayanagi). Therefore, it would have been obvious to combine Takayanagi with Ohno to obtain the invention as specified in claim 20.

Regarding claim 21: Ohno discloses applying a correction to the printing registration (column 6, lines 60-63 of Ohno). It would therefore be inherent that said applying step comprises replacing values above or below a threshold value since correcting the printing registration would alter the positions at which halftone data is printed (column 6, lines 62-67 of Ohno).

Ohno does not disclose expressly applying a combination of at least two of replacing values above or below a threshold value; multiplying each value by a linear factor; and applying a gamma correction function to values.

Takayanagi discloses applying gamma correction to values (figure 11 and column 7, lines 32-39 of Takayanagi). Said gamma correction multiplies each value by a linear factor (column 7, lines 32-33 and lines 37-39 of Takayanagi).

Ohno and Takayanagi are combinable because they are from the same field of endeavor, namely image printing and correction. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to apply correction to the image data by using a gamma correction function with a linear factor, as taught by Takayanagi, in addition to the correction taught by Ohno. The motivation for doing so would have been to correct density unevenness (column 8, lines 49-51 of Takayanagi). Therefore, it would have been obvious to combine Takayanagi with Ohno to obtain the invention as specified in claim 21.

Regarding claim 24: Ohno discloses said applying step (column 6, lines 60-63 of Ohno).

Ohno does not disclose expressly that said applying step comprises modifying the average number of dots printed by an individual printing element whose density is defective.

Takayanagi discloses modifying the average number of dots printed by an individual printing element whose density is defective (column 7, lines 20-26 of

Takayanagi). Adjusting the density balance of a color inherently modifies the average number of dots printed by the individual printing element of said color.

Ohno and Takayanagi are combinable because they are from the same field of endeavor, namely image printing and correction. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to apply a gamma correction function to correct the density balance. The motivation for doing so would have been to correct density unevenness (column 8, lines 49-51 of Takayanagi). Therefore, it would have been obvious to combine Takayanagi with Ohno to obtain the invention as specified in claim 24.

5. Claims 28 and 31-33 rejected under 35 U.S.C. 103(a) as being unpatentable over Ohno (US Patent 5,813,333) in view of Cobbs (US Patent 5,600,350).

Regarding claim 28: Ohno discloses that the defects comprise printer misregistration (column 8, lines 6-11 of Ohno). Printer misregistration inherently creates an area-fill non-uniformity since the colors used to print, and thus fill said area, are improperly offset from one another.

Ohno does not disclose expressly that said measuring step comprises using a sensing system to measure area-fill non-uniformity for plural printing-medium advance values; and selecting a printing-medium advance value that corresponds to minimum area-fill non-uniformity.

Cobbs discloses using a sensing system to measure area-fill non-uniformity for plural printing-medium advance values (column 6, lines 44-48 of Cobbs); and selecting

a printing-medium advance value that corresponds to minimum area-fill non-uniformity (column 6, lines 47-51 of Cobbs). An offset in the printing of the individual colors (column 6, lines 55-59 of Cobbs) will inherently create an area-fill non-uniformity. The measure of the cartridge misalignment therefore measure the area-fill non-uniformity since the amount of misalignment directly relates to the amout of area-fill non-uniformity.

Ohno and Cobbs are combinable because they are from the same field of endeavor, namely the correction of misregistration in color printers. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to apply a sensor to detect the amount of printer cartridge misalignment, as taught by Cobbs. The motivation for doing so would have been to be able to properly print a color document (column 5, lines 17-20 of Cobbs). Therefore, it would have been obvious to combine Cobbs with Ohno to obtain the invention as specified in claim 28.

Regarding claim 31: Ohno discloses a printing step (column 6, lines 64-67 of Ohno).

Ohno does not disclose expressly comparing optimum advance values or swath-height values measured for the plurality of multielement printing arrays respectively, to find the smallest of said values; selecting a particular multielement printing array whose said value is substantially the smallest; using, in common for the plurality of printing arrays, substantially said selected smallest value; and for substantially each array other that the particular array, operating with a respective reduced number of printing

elements and with rescaled data, to match an actual effective swath height of the particular array.

Cobbs discloses comparing optimum advance values or swath-height values (column 9, lines 48-52 of Cobbs) measured for the plurality of multielement printing arrays respectively (column 9, lines 55-60 of Cobbs), to find the smallest of said values (column 10, lines 4-9 of Cobbs); selecting a particular multielement printing array whose said value is substantially the smallest (column 10, lines 1-2 of Cobbs); using, in common for the plurality of printing arrays, substantially said selected smallest value (column 10, lines 1-7 of Cobbs); and for substantially each array other that the particular array, operating with a respective reduced number of printing elements and with rescaled data, to match an actual effective swath height of the particular array (column 10, lines 4-9 of Cobbs). Phase difference is calculated (column 9, lines 38-42 of Cobbs) and used to correct the pen offsets by selecting the particular pens to use from among a plurality of pens (column 10, lines 1-7 of Cobbs), thus correcting the offset of the image (column 10, lines 7-9 of Cobbs). Since there are only particular pens to select (column 10, lines 4-7 of Cobbs), the calculated phase difference is used to select a minimum possible value for the printing offset of all of the colors.

Ohno and Cobbs are combinable because they are from the same field of endeavor, namely the correction of misregistration in color printers. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to use the image registration correction and pen selection method of Cobbs in the method of Ohno. The motivation for doing so would have been to improve printing in the case of

paper slippage (column 9, lines 20-21 of Cobbs). Therefore, it would have been obvious to combine Cobbs with Ohno to obtain the invention as specified in claim 31.

Further regarding claim 32: Cobbs further discloses that said smallest of said values is determined taking into account the maximum available number of printing elements in the corresponding array (column 10, lines 1-7 of Cobbs). Since particular pens have to be specifically selected (column 10, lines 1-7 of Cobbs), the maximum available number of printing elements in the corresponding array must inherently be taken into account.

Regarding claim 33: Ohno discloses, after the scaling step (column 16, lines 35-36 of Ohno), iterating the measuring and scaling steps to allow for nonlinearity in such print-quality defects (figure 4 and column 7, lines 29-35 of Ohno). Registration marks (figure 4(21) of Ohno) are printed on the traveling paper web (column 7, lines 17-19 of Ohno) and are read twice per rotation of the plate cylinder (column 7, lines 29-35 of Ohno). Since the method is performed for each reading of a registration mark (column 6, lines 38-41 and lines 53-56 of Ohno), this inherenty causes the iteration of the measuring and scaling steps.

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Sievert et al., US Patent 5,796,414, August 18, 1998.

Hiramatsu et al., US Patent 5,798,773, August 25, 1998.

de Jong et al., US Patent 5,287,162, February 15, 1994.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to James A Thompson whose telephone number is 703-305-6329. The examiner can normally be reached on 8:30AM-5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David K Moore can be reached on 703-308-7452. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

James A. Thompson
Examiner
Art Unit 2624

JAT
May 14, 2004

Dave Moore

DAVID MOORE
SUPERVISORY PATENT EXAMINER
TECHNOLOGY C